

WHAT IS CLAIMED IS:

- 1 1. A method for selectively killing neoplastic tissue in a living organism,
2 said method comprising irradiating at least a portion of said living organism in which said
3 tissue resides with electromagnetic radiation of a wavelength that is absorbed preferentially
4 by said neoplastic tissue relative to adjacent tissue at a sufficient intensity and for a sufficient
5 duration that said neoplastic tissue is killed by heat generated by said radiation without
6 substantial killing of said adjacent tissue.
- 1 2. The method of claim 1 wherein said wavelength is selected by
2 comparing absorption spectra of said neoplastic tissue and of said portion of said living
3 organism to identify a wavelength at which said neoplastic tissue will absorb said
4 electromagnetic radiation preferentially relative to said surrounding tissue in said portion.
- 1 3. The method of claim 1 wherein said neoplastic tissue is a skin lesion.
- 1 4. The method of claim 3 wherein said skin lesion is a member selected
2 from the group consisting of dermatofibroma, seborrhoeic keratosis, actinic keratosis,
3 keratoacan thoma, basal cell carcinoma, squamous cell carcinoma, nevus intradermalis, nevus
4 compositus, dysplatic nevus, and lentigo maligna.
- 1 5. The method of claim 1 wherein said wavelength is within a range
2 selected from the group consisting of 1510-1610 nm, 1040-1070 nm, and 3006-3400 nm.
- 1 6. The method of claim 1 wherein said wavelength is approximately
2 265 nm.
- 1 7. The method of claim 1 wherein said electromagnetic radiation is of a
2 magnitude and duration sufficient to cause said neoplastic tissue to rise in temperature to a
3 target temperature of from about 75°C to about 90°C without causing said surrounding tissue
4 to reach said target temperature.
- 1 8. The method of claim 1 comprising conveying said radiation to a
2 treatment site within said living organism through a member selected from the group
3 consisting of fiber optics, light pipes and wave guides inserted into said organism.

1 **9.** A method for deactivating enzymes in living tissue, said method
2 comprising irradiating said tissue with electromagnetic radiation of a wavelength that is
3 absorbed by said enzymes preferentially relative to molecules of said tissue other than said
4 enzymes, at a sufficient intensity and for a sufficient period of time that said enzymes are
5 denatured by heat generated by said radiation without substantial denaturation or damage of
6 said other molecules.

1 **10.** The method of claim 9 wherein said irradiation is performed
2 sufficiently to cause irreversible denaturation of said enzymes.

1 **11.** The method of claim 9 wherein said wavelength is selected by
2 comparing absorption spectra of said enzymes and of said molecules of said tissue other than
3 said enzymes to identify a wavelength at which said enzymes will absorb said
4 electromagnetic radiation preferentially relative to said other molecules.

1 **12.** A method for sterilizing an object made of a material of construction
2 comprising synthetic polymer selected from the group consisting of polyethylene,
3 polystyrene, and polypropylene that has been in contact with biological material, said method
4 comprising irradiating said object with electromagnetic radiation at a wavelength that is
5 selectively absorbed by covalent O-H bonds to dehydrate any glucose present on said object
6 without causing substantial change to the molecular structure of said synthetic polymer.

1 **13.** The method of claim 12 wherein said wavelength is within the range of
2 from about 2.8 microns to about 3.3 microns.

1 **14.** A method for sterilizing an object made of a material of construction
2 comprising silicone, said method comprising irradiating said object with electromagnetic
3 radiation at a wavelength that is selectively absorbed by covalent N-H bonds to decompose
4 proteinaceous matter on said object without causing substantial change to the molecular
5 structure of said silicone.

1 **15.** A method for sterilizing an object that has been in contact with
2 biological material, to render said object non-bioreactive, said method comprising irradiating
3 said object with electromagnetic radiation at a wavelength that is selectively absorbed by a
4 bio-reactive substance member selected from the group consisting of RNases, DNases,

5 pyrogens, and nucleic acids at a sufficient intensity and a sufficient period of time to
6 decompose any of bio-reactive substance adhering to said object without causing substantial
7 change to the molecular structure of said material of said object.

1 **16.** A method for the treatment of mammalian tissue infected with a
2 microorganism, said method comprising irradiating said mammalian tissue with
3 electromagnetic radiation of a wavelength that is preferentially absorbed by a component of a
4 cell of said microorganism relative to said mammalian tissue at a sufficient intensity and for a
5 sufficient duration to deactivate said microorganism.

1 **17.** The method of claim 16 wherein said component is a peptidoglycan.

1 **18.** The method of claim 16 wherein said component is a glycocalyx.

1 **19.** The method of claim 16 wherein said component is an autolysin.

1 **20.** The method of claim 16 wherein said component is chitin.

1 **21.** A method for the treatment of a bacterial infection in mammalian
2 tissue, said method comprising irradiating said mammalian tissue with electromagnetic
3 radiation of a wavelength that is preferentially absorbed by porins relative to said mammalian
4 tissue at a sufficient intensity and for a sufficient duration to deactivate said bacteria.

1 **22.** A method for the treatment of a subject suffering from a disease
2 condition whose proliferation is mediated by furin, said method comprising exposing said
3 subject to electromagnetic radiation of a wavelength that is preferentially absorbed by porins
4 relative to said mammalian tissue of a wavelength that is preferentially absorbed by said furin
5 relative to said mammalian tissue at a sufficient intensity and for a sufficient duration to
6 deactivate said furin.

1 **23.** A method for the treatment of a foodstuff to decompose foreign matter
2 therein, said method comprising exposing said foodstuff to electromagnetic radiation of a
3 wavelength that is preferentially absorbed by said foreign matter relative to said mammalian
4 tissue at a sufficient intensity and for a sufficient duration to decompose said foreign matter.